# Grade 3 Math Curriculum Benchmarks

## Operations and Algebraic Reasoning

| Term | **Understands relationship between multiplication and division**<br>**3.OA.1, OA.2, OA.5, OA.6**<br>**A rating of 4 is not available for this standard** |
|---|---|
| 1 | Represent multiplication as equal groups with concrete objects and drawings. |
| 2 | Interpret whole-number products.<br>Understand division as an unknown factor problem.<br><br>Understand and apply the Commutative property of multiplication (turn around rule), Associative property of multiplication (Ex: 7x5x2= 7x(5x2)).<br><br>Note: Students do not need to use the formal terms for these properties. |
| 3 | Interpret whole -number products. (Ex: describe a situation where a total number of objects can be expressed as 5x7)<br><br>Interpret whole-number quotients of whole numbers (Ex: describe a situation where a number of shares or number of groups can be expressed as 56÷8)<br><br>Understand division as an unknown factor problem.<br><br>Understand and apply the Commutative property of multiplication (turn around rule), Associative property of multiplication (Ex: 7x5x2= 7x(5x2)), and the Distributive property of multiplication (Partial product: 4 x 12= (4x10) + (4x2).)<br><br>Note: Students do not need to use the formal terms for these properties. |

| Term | **Represents and Solves Problems Involving Multiplication and Division.** |
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| | 3.OA.3, 3.OA.4 |
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| 1 | Uses multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities by using drawings and equations with a symbol for the unknown number to represent the problem for the multiplication tables of 0, 1, 2, 5, and 10.<br><br>Finds the unknown whole number in a multiplication or division equation relating 3 whole numbers for the multiplication tables of 0, 1, 2, 5, and 10. Ex: Find the unknown number that makes the equation true in each of the equations: 2 x ? = 12, 5 = ? ÷ 3, 4 x 4 = ? |
| 2 | Uses multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities by using drawings and equations with a symbol for the unknown number to represent the problem for the multiplication tables of 0, 1, 2, 5, and 10.<br><br>Finds the unknown whole number in a multiplication or division equation relating 3 whole numbers for the multiplication tables of 0, 1, 2, 3, 4, 5, and 10. Ex: Find the unknown number that makes the equation true in each of the equations: 2 x? = 12, 5 =? ÷ 3, 4 x 4 =? |
| 3 | Uses multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities by using drawings and equations with a symbol for the unknown number to represent the problem.<br><br>Finds the unknown whole number in a multiplication or division equation relating three whole numbers. Ex: Find the unknown number that makes the equation true in each of the equations: 8 x? = 48, 5 =? ÷ 3, 6 x 6 =? |

| Term | Knows Multiplication and Related Division Facts Through 10 X 10<br>3.OA.7 |
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| 1 | Fluently multiplies using strategies for all products of 1 digit numbers and 1, 2, 5, and 10 and recognizes relationship between multiplication and division. |
| 2 | Knows from memory multiplication facts for the multiplication tables of 0-5 and 10. |
| 3 | Knows from memory multiplication and related division facts though 10 x 10. |

| Term | Solves Multi-step Problems Involving the Four Operations.<br>3.OA.8 |
|---|---|
| 1 | Solves multi-step word problems involving addition and subtraction. |
| 2 | Solves multi-step word problems involving addition, subtraction, and multiplication with 0-5 and 10. |
| 3 | Solves multi-step word problems involving addition, subtraction, multiplication and division. |

| Term | Identifies and Explains Patterns in Arithmetic.<br>3.OA.9 |
|---|---|
| 1 | NA |
| 2 | Identify patterns in arithmetic involving addition, subtraction and multiplication. |
| 3 | Identify and explain patterns in arithmetic involving addition, subtraction, multiplication, and division. Explain the patterns using the properties of operations. Ex: Explain why 4 times a number can be decomposed into two equal addends. |

## Number and Operations in Base 10

| Term | Uses Place Value Understanding to Round Whole Numbers and Multiply.<br>3.NBT.1, NBT.3 |
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| 1 | Round whole numbers to the nearest 10 or 100. |
| 2 | Round whole numbers to the nearest 10 or 100. |
| 3 | Round whole numbers to the nearest 10 or 100.<br><br>Multiply one-digit whole numbers by multiples of 10 in the range 10-90. (Extension facts) |

| Term | Uses Place Value Understanding and Properties of Operations to Add and Subtract |
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| | NBT.2 |
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| 1 | Fluently add and subtract 2-digit numbers using strategies based on place value, properties of operations and/or the relationship between addition and subtraction. |
| 2 | Fluently add and subtract within 1000 using strategies based on place value, properties of operations and /or the relationship between addition and subtraction. |
| 3 | Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations and/or the relationship between addition and subtraction. |

## Number and Operations-Fractions

| Term | Develops understanding of fractions as numbers<br>3.NF.1, NF.2, NF.3 |
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| 1 | NA |
| 2 | Identify and represent given unit (1/b) and non-unit (a/b) fractions using pictures, words, and fraction circles. |
| 3 | Understand a fraction as a number on a number line and represent fractions on a number line diagram. Students are able to redefine the area between 0 and 1 by partitioning the section into equal (b) parts to find 1/b or a/b.<br><br>Understand unit fractions as one part of the whole. Fraction a/b is the quantity formed by combining parts of size 1/b. Ex: ¾ = ¼+¼+¼<br><br>Understand that two fractions are equivalent if they are the same size or at the same point on the number line<br><br>Using visual fraction models recognize and create simple equivalent fractions, e.g. ½=2/4. 4/6=2/3.<br><br>Express whole numbers as fractions and recognize fractions that represent the same whole number. Ex: 3=3/1 and 3/1 = 6/2. Locate 4/4 at the same point on the number line as 1. |

## Measurement and Data

| Term | Solves Problems Involving Measurement and Estimation of Time, Liquid Volume and Masses of Objects. 3.MD.1, 3.MD.2 |
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| 1 | Tell and write time to the nearest 5 minutes and use an open number line with other tools to add time intervals in minutes. |
| 2 | Tell and write time to the nearest minute and measure elapsed time in minutes.<br><br>Solve word problems involving time intervals using open number lines and other tools. |
| 3 | Tell and write time to the nearest minute and measure elapsed time in minutes.<br><br>Solve word problems involving addition and subtraction of time intervals using open number lines and other tools.<br><br>Measure and estimate liquid volumes and masses (weight) of objects in grams (g), kilograms (kg) and liters (l).<br><br>Use the four operations to solve one-step word problems involving masses or volumes that are given in the same units. May use drawings to represent the problem. |

| Term | Represents and interprets data using picture graphs, bar graphs and line plots. 3.MD.3, MD.4 |
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| 1 | Solve one-step how many more and how many less problems using information from bar graph.<br><br>Measure lengths to the nearest inch using rulers marked with whole and half inches. |
| 2 | Represent a data set with several categories on a given scaled bar graph.<br><br>Solve one-step how many more and how many problems using information from bar graph.<br><br>Measure lengths to the nearest half inch using rulers marked with wholes, halves and fourths of an inch. |

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| | Represent data on a line plot where the horizontal scale is marked off in whole numbers and halves. |
| 3 | Draw a scaled picture graph and a scaled bar graph to represent data from several categories.<br>Solve one and two step “how many more” and “;how many less” problems using information from bar graph.<br><br>Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch.<br><br>Show data by making a line plot where the horizontal scale is marked off in appropriate units-whole numbers, halves, or quarters. |

| Term | **Understands Area and Perimeter.**<br>**3.MD.5, MD.6, MD.7, MD.8** |
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| 1 | NA |
| 2 | Understand area is a plane figure covered, without gap or overlap in square units.<br>Understand a square with side length 1 unit is called a square unit.<br><br>Measure area by counting unit squares (square cm, m, in, ft, etc.)<br><br>Relate area to multiplication and division:<br>Find area of a rectangle with whole-number sides by tiling it, and show that the area is the same as it would be by multiplying the length and width. Use area formula to solve word problems and represent products as rectangular areas. Ex: 24 could represent area in square feet of a rectangular room that is 6ft by 4 ft or 8ft by 3ft.<br>Solve real-world and mathematical problems involving perimeters of polygons. |
| 3 | Understand area is a plane figure covered, without gap or overlap in square units.<br>Understand a square with side length 1 unit is called a square unit.<br><br>Measure area by counting unit squares (square cm, m, in, ft, etc.)<br><br>Relate area to multiplication and division:<br>Find area of a rectangle with whole-number sides by tiling it, and show that the area is the same as it would be by multiplying the length and width. Use area formula to solve word problems and represent products as rectangular |

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| | areas. Ex: 24 could represent area in square feet of a rectangular room that is 6ft by 4 ft or 8ft by 3ft. Use tiling to demonstrate the distributive property: the area of a rectangle with lengths a and b+c = axb + axc. Ex: The area of a 4 by 12 rectangle = 4 x10 + 4 x 2 or 4x6 + 4x6 Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of each part together. (Find area of complex figures composed of rectangles.)<br>Solve real-world and mathematical problems involving perimeters of polygons: find unknown side length; find different areas for the same perimeter and different perimeters for the same area. |

## Geometry

| Term | Reason with Shapes and Their Attributes<br>3.G.1, 3.G.2 |
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| 1 | NA |
| 2 | Understand that shapes in different categories may share attributes. |
| 3 | Understand that shapes in different categories may share attributes and that shared attributes can define a larger category. Ex: Rhombuses and rectangles have four sides and both belong to the larger category of quadrilateral.<br><br>Partition shapes into parts with equal areas and express the area of each part as a unit fraction of the whole. Ex: Partition a rectangle into 4 equal parts and describe each part as ¼ of the area of the shape. |

## Mathematical Practice

Listed below are examples of the use of mathematical practice. Practice and evidence are embedded in the lessons. Like the content standards, Mathematical Practices are scored by term. If a student is meeting the expectations of each lesson's mathematical practice, he/she is meeting the term expectations or benchmarks.

| Term | Makes Sense of Problems and Perseveres in Solving Them<br>SMP.1, SMP.2, SMP.7, SMP.8 |
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| 1, 2, 3 | *Students explain the meaning of a problem to themselves and can discuss how they solved it. They ask themselves: "Does this make sense?" and "Can I solve this problem a different way?" They often use another method to check their answer. |

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| | *Students recognize that a number represents a specific quantity and can write simple expressions and create logical representations of problem situations.<br>*Students recognize pattern and structure. Ex: Students use properties of operations to explain calculations (Use Distributive property and partial products model to explain multi-digit multiplication).<br>*Students notice repetitive actions in computation and look for shortcut methods. Ex: Use Distributive property as a strategy to find products they don't know by using products they know. 7x8= (5x8) + (2x8) |

| Term | Models and Explains Using Tools<br>MPS.3, MPS.4, MPS.5, MPS.6 |
|---|---|
| 1, 2, 3 | *Students ask and can explain questions such as: "How did you get that?" and "Why is that true?" They explain their thinking and respond to others.<br>*They experiment with representing problem situations in multiple ways as needed including: writing numbers and words (using mathematical language) drawing pictures using objects making a chart, list, or graph creating equations.<br>*Students consider available tools (including estimation) when solving mathematical problems and decide when certain tools might be helpful. Ex: A student uses graph paper to find all possible rectangles that have a given perimeter.<br>*Students use clear and precise language (oral and written), organize their work, and are accurate. Ex: Students use square units when recording the area of a rectangle. |